

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

STANDING STOCKS OF FISHES IN
SECTIONS OF LITTLE LAST CHANCE
CREEK, PLUMAS COUNTY, 1994

by

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1995

STANDING STOCKS OF FISHES IN SECTIONS
OF LITTLE LAST CHANCE CREEK, PLUMAS COUNTY, 1994

INTRODUCTION

The Department of Water Resources (DWR) initiated an instream flow program in 1976 to identify streams that would benefit from flow enhancement and to assess instream values. The Northern District of the DWR selected Little Last Chance Creek below Frenchman Reservoir (Figure 1) as one of the streams to study under this program.

Department of Fish and Game (DFG) biologists studied trout populations in Little Last Chance Creek in 1976, 1981, 1986, and 1988. Northern pike (Esox lucius) were illegally introduced into Frenchman Reservoir prior to 1988 so the DFG poisoned fishes in the reservoir in 1991. Studies of trout in the creek resumed in 1991 and continued in 1992, 1993, and 1994. Brown trout (Salmo trutta) was the only game fish caught each year. Sacramento suckers (Catostomus occidentalis) were also caught each year (Brown 1976, Bumpass et al. 1989, Brown 1991, Brown 1992a, Brown 1992b, Brown 1993, Brown 1994). This report documents the results of sampling conducted in 1994.

The purpose of this study is to evaluate the effects of the operation of Frenchman Reservoir on populations of trout in Little Last Chance Creek through the periodic sampling of fish at established stations in that creek.

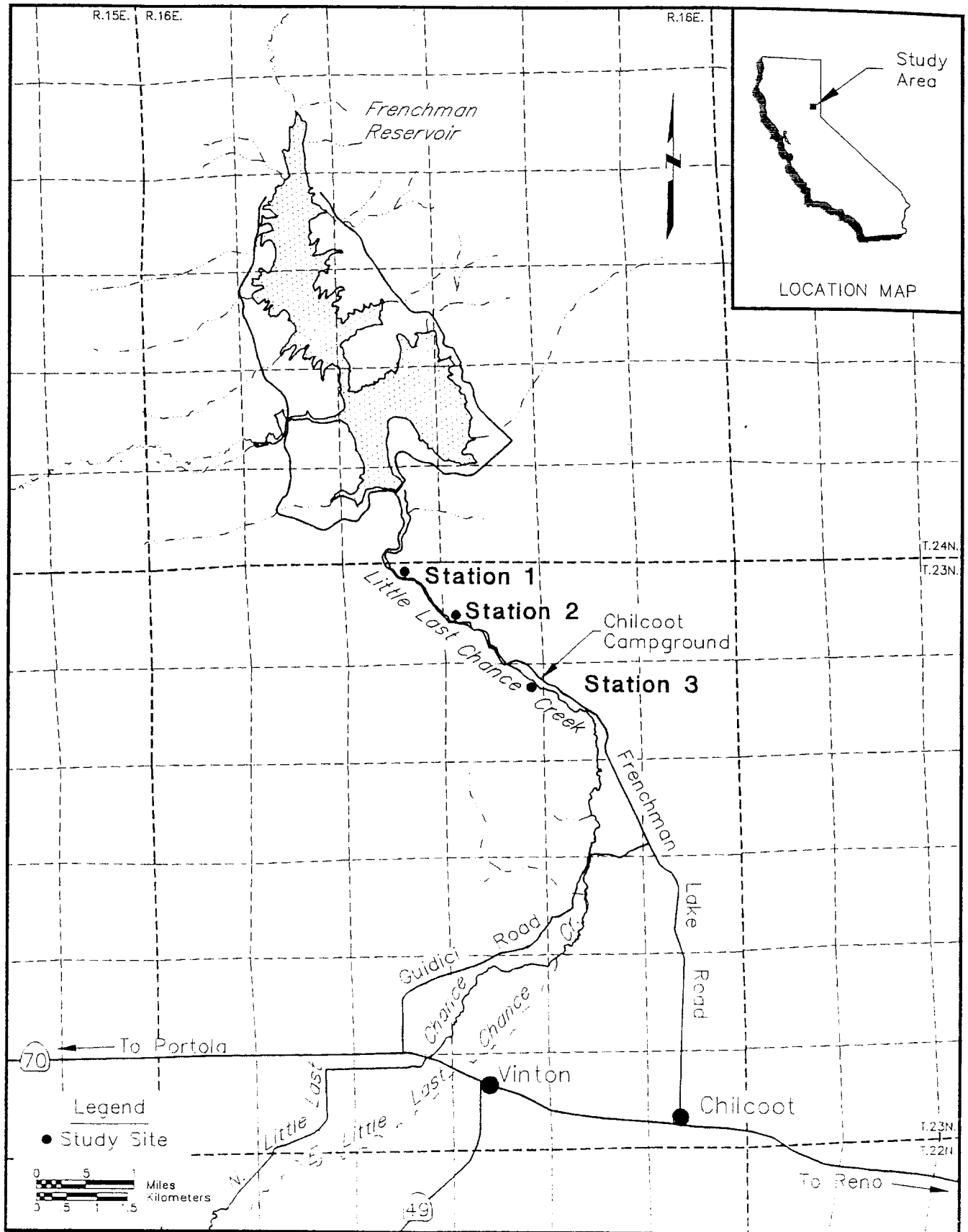


Figure 1. Stations Sampled to Estimate Standing Stocks of Fish in Little Last Chance Creek, Plumas County, 1994.

Results of this report and previous reports on Little Last Chance Creek will be discussed in a summary report that will evaluate the current operation of Frenchman Reservoir and make recommendations regarding its future operations.

METHODS

Standing stocks of fishes were estimated at three stations in Little Last Chance Creek in Plumas County in September, 1994. Stations were intentionally selected to be near stations sampled in previous DFG studies (Appendix 1). Markers had previously been placed in trees along the stream to identify station boundaries. Stations varied in length from 47.3 to 77.5 m. The length, average width, and average depth of each station was measured. Fish were captured with a battery-powered backpack electroshocker in stream sections blocked by seines. Captured fish were removed from the net-enclosed section on each pass. Standing stock estimates were developed using the two-count method of Seber and LeCren (1967) or the multiple-pass method of Leslie and Davis (1939) with limits of confidence computed using a formula proposed by DeLury (1951).

The weight of each trout was determined by displacement. Fork length (FL) of each fish was measured to the nearest millimeter. Scale samples were not taken because all fish caught were of hatchery origin. Growth of these fish did not reflect the environment in Little Last Chance Creek.

Distribution of fish caught is listed according to location. Standing crops of brown trout were calculated for individual stations where each fish was caught.

RESULTS AND DISCUSSION

Brown trout were caught at stations 1, 2, and 3.

Brown trout ranged in size from 72 to 390 mm (Figure 2). Brown trout biomass averaged 10.8 g/m² at three stations. Biomass of brown trout large enough for anglers to catch and keep (≥ 127 mm FL) averaged 9.0 g/m² (Table 1 and Appendix 2).

TABLE 1. Estimate of brown trout standing crop in Little Last Chance Creek, Plumas County, 1994.

Distance Below Frenchman Dam (km)	Population Estimate	95% Confidence Interval	Biomass (g/m ²)	Estimate of Catchable Trout (≥ 127 mm FL)	Biomass of Catchable Trout (g/m ²)
1.6	71	57-90	25.8	18	20.5
3.2	7	7-8	3.1	7	3.1
4.4	4	4-6	3.5	4	3.5

The relationship between length (L) and weight (W) of brown trout is:

$$\text{Log}_{10} W = -5.1 + 3.1 \text{ Log}_{10} L$$

$$r^2 = 0.99$$

$$N = 68 \text{ (Appendix 2)}$$

The average condition factor of 68 brown trout was 1.1420.

Brown trout population estimates before treatment averaged 10 trout and 5 trout after treatment (Table 2). Biomass averaged 3.3 g/m² before treatment and 0.7 g/m² after treatment. Rainbow trout population estimates averaged 41 trout before treatment and <1 trout after. Biomass averaged 7.1 g/m² before treatment and 0.2 g/m² after.

TABLE 2. Average standing crop and biomass for brown and rainbow trout in Little Last Chance Creek, 1976-1993.

Year	Brown Trout		Rainbow Trout	
	Population Estimate	Biomass g/m ²	Population Estimate	Biomass g/m ²
Before treatment				
1976	1	1.2	8	13.9
1981	6	2.7	17	4.0
1986	10	3.7	96	3.8
1988	21	5.5	43	6.5
After treatment				
1991	<1	0.3	0	0
1992	3	0.1	1	0.5
1993	16	1.7	0	0

The trout we caught were planted by the DFG in spring and summer 1993 and 1994. The DFG planted fingerling and catchable brown trout and rainbow trout in 1993 and fingerling brown trout in 1994 (Ron DeCoto, Fishery Biologist, DFG, personal communication). The small trout (75-129 mm) we caught this year were planted by the DFG earlier this year. The 184 mm trout we caught may have been a survivor from last year's fingerling plant. The larger trout (215-390 mm) survived from plants over the last few years.

So few fish were caught (Table 2) because the DFG treated Frenchman Reservoir, Little Last Chance Creek and parts of the Feather River with rotenone to kill northern pike (Esox lucius). The DFG killed northern pike in this watershed to prevent them from migrating downstream into the Sacramento River. The DFG feels that pike could become established in the Sacramento River and become significant predators on juvenile salmonids (Brown 1992).

The 23 large trout (215-390 mm) we caught were nearly ripe. They probably spawned in October or November. We have observed that spawning gravel is concentrated above station 1 (Figure 1). That is where we expect most trout to spawn. If spawning has been successful we will observe age 0+ trout in all stations because they will distribute themselves downstream through the spring and summer in search of food and space.

While our periodic sampling of trout in Little Last Chance Creek has allowed us to observe the prolonged effects of rotenone on trout populations and their recovery, the purpose of our study has not changed. We still plan to continue to evaluate the effects of the operation of Frenchman Reservoir on trout populations in Little Last Chance Creek.

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APPENDIX 1

PERMANENT FISH POPULATION STATIONS FOR LITTLE LAST CHANCE CREEK, PLUMAS COUNTY SEPTEMBER 1994

Station 1 - Located 1.6 km below Frenchman Dam just downstream from the first bridge at elevation of 1659 m MSL in NW 1/4 of NE 1/4, Section 4, T23N, R16E. This station begins in a riffle beneath the bridge carrying Frenchman Lake Road, then enters a pool with a deeply undercut room-sized boulder on the right bank. The remainder of the station is a short riffle and a shallow pool/run. About 55 percent of the station is pool and 45 percent riffle. Substrate is boulder, rubble, and sand. The station is 47.3 m long with a surface area of 203.4 m² at a flow of 0.4 cms.

Station 2 - Located 3.2 km below Frenchman Dam adjacent to the upper end of a large turnout at an elevation of 1610 m MSL in NW 1/4 of SW 1/4, Section 3, T23N, R16E. This station begins in a large plunge pool followed by two shallow pool/run areas and two short riffles. About 45 percent of the station is pool and 55 percent riffle. Substrate is boulder, rubble, and sand. The station is 77.5 m long with a surface area of 511 m² at a flow of 0.4 cms.

Station 3 - Located 4.4 km below Frenchman Dam adjacent to the cutoff road in the center of Chilcoot Campground at an elevation of 1561 m MSL in NE 1/4 of NE 1/4, Section 10, T23N, R16E. This station begins in a steep rapid followed by a long pool with undercut right bank, then a short riffle, a short pool, and finally, another steep riffle. The station is 40 percent pool and 60 percent riffle. Substrate is boulders, rubble, and sand. The station is 57.3 m long with a surface area of 337.5 m² at a flow of 0.4 cms.

APPENDIX 2

LENGTH AND WEIGHT OF BROWN TROUT CAUGHT IN LITTLE LAST CHANCE CREEK, 1994

<u>Fork Length (mm)</u>	<u>Weight (g)</u>	<u>Fork Length (mm)</u>	<u>Weight (g)</u>
72	3	104	12
75	4	106	11
75	5	108	14
76	5	110	15
79	5	115	16
79	6	116	17
80	6	126	23
81	5	129	21
81	6	184	70
81	6	215	115
81	6	220	120
82	6	223	120
82	7	225	157
82	7	238	158
83	7	240	145
84	7	242	145
84	7	243	160
85	6	243	164
85	8	252	186
89	7	254	175
89	9	258	208
90	9	258	250
91	8	270	200
91	9	284	250
91	9	286	280
92	9	300	345
94	9	302	300
95	10	305	350
96	8	309	368
96	11	310	390
98	11	325	400
98	11	330	450
100	12	390	750
101	10		
101	11		